



## Monitoring Report

### Site Details

Site ID: 990214 Road Name: SR 112 Mile Post: 33.21

Stream: Joe Cr Tributary to: Strait of Juan de Fuca

### Monitoring Inspection Details:

Inspection Type: Post-construction

Inspection Date: 10/19/2016

Inspector(s): Damon Romero

### Post Construction Information

Structure conforms to permits and plans? Yes Structure Type: Culvert

Structure comments:

Alignment/configuration conforms to permits and plans? Yes

Alignment comments:

Dimension conforms to permits and plans? Yes

Dimension comments:

Bridge/Culvert Span (ft): 20.00 Structure Length (ft) 100.00 Structure Rise (ft): 10.00

Streambed Slope (%): 1.33 Culvert shape: Rectangular Culvert Material: Precast Concrete

Culvert Shape Material Comment

Streambed channel conforms to permits and plans?

Streambed Material: Yes Streambed Shape/Flow: No Streambed Slope: Yes

Post-Construction stream channel Comments:

Do other Design Features (LWM, coarse bands, barbs, preformed pools, etc) conform to permits and plans?

Additional Details:

### Monitoring Parameters (all intervals):

#### Streambed Material

Has the Site experienced a bankfull event? Yes

Is there streambed material throughout the Structure? Yes

Is there streambed material throughout the Design Channel? N/A

Freeboard at outlet (ft) at inlet (ft)



## Monitoring Report

Compare the streambed material throughout the structure and design channel to the common condition:

Similar

Streambed Material Comments:

### Channel Flow / Shape

Is there unusual subsurface flow compared to the common condition of the reach? N/A

Does a low-flow channel exist through the entire length of the structure and design channel:

Yes

The depth of the channel throughout the structure and the design channel compared to the common condition of the reach is:

Similar

The channel shape throughout the structure and the design channel compared to the common condition of the reach is:

More "V" Shaped

Is the channel shape consistent with the design expectations?

Other

If No or Undetermined, explain:

Describe the channel path within the structure and the design channel:

Straight Line

Does the channel contact the structure wall at any location?

No

If yes, the percentage of channel length in contact is:

Also, if yes, contact is:

Is there a measurable BFW inside the structure?

Bankfull Width (BFW) of the channel within the structure: (ft)

16.50

BFW inside the structure compared to the design channel:

Similar

BFW inside the structure compared to the common condition:

Similar

BFW of the design channel compared to the common condition is:

There is a defined channel: Through the entire project.

Channel Additional comments:

### Streambed Slope

Streambed Slope (%) Upstream of the Structure: Throughout the structure: 1.33

Downstream of the structure: Overall project:

Describe streambed slope throughout the project compared to the common condition of the reach:

Steeper

Streambed Slope Compared to Reach Comments:

Streambed Slope Comments:

pre-2017 assessment did not include additional slope measurements



## Monitoring Report

### Other Details

Are there any Channel-Spanning hydraulic drops within the structure or the design channel greater than 0.50 feet?

No

If Yes, provide comments, including descriptions of any headcutting or aggrading:

Do other Design Features (LWM, coarse bands, barbs, preformed pools, etc) function as intended?

No

Features Comments:

Photos taken during inspection? Yes

### Final Determination

Is the structure Fish Passable? Yes

Risks noted to stream function, refer to category:

Actions determined by Monitoring: Increased Monitoring

Inspection Action Comments:

Additional Comments:

LWM placed inside of culvert at inlet. Flag for low-flow monitoring. Questions answered as 'other' do not pertain to pre-2017 assessments.



## Monitoring Report

### Site Details

Site ID: 990214 Road Name: SR 112 Mile Post: 33.21

Stream: Joe Cr Tributary to: Strait of Juan de Fuca

### Monitoring Inspection Details:

Inspection Type: Over-winter

Inspection Date: 7/26/2017

Inspector(s): Damon Romero

### Monitoring Parameters (all intervals):

#### Streambed Material

Has the Site experienced a bankfull event? Yes

Is there streambed material throughout the Structure? Yes

Is there streambed material throughout the Design Channel? Yes

Freeboard at outlet (ft) at inlet (ft)

Compare the streambed material throughout the structure and design channel to the common condition:

Similar

Streambed Material Comments:

Native materials are finer DS and more similar to culvert subs US.

#### Channel Flow / Shape

Is there unusual subsurface flow compared to the common condition of the reach? No

Does a low-flow channel exist through the entire length of the structure and design channel:

Yes

The depth of the channel throughout the structure and the design channel compared to the common condition of the reach is:

Similar

The channel shape throughout the structure and the design channel compared to the common condition of the reach is:

Similar

Is the channel shape consistent with the design expectations?

Yes

If No or Undetermined, explain:

Describe the channel path within the structure and the design channel:

Meandering

Does the channel contact the structure wall at any location?

No

If yes, the percentage of channel length in contact is:

Also, if yes, contact is:

Is there a measurable BFW inside the structure?

Bankfull Width (BFW) of the channel within the structure: (ft)

15.00

BFW inside the structure compared to the design channel:

Similar

BFW inside the structure compared to the common condition:

Similar



## Monitoring Report

BFW of the design channel compared to the common condition is: \_\_\_\_\_

There is a defined channel: Through the entire project. \_\_\_\_\_

Channel Additional comments:

### Streambed Slope

Streambed Slope (%) Upstream of the Structure: 2.50 Throughout the structure: 2.00

Downstream of the structure: 1.00 Overall project: \_\_\_\_\_

Describe streambed slope throughout the project compared to the common condition of the reach: \_\_\_\_\_

Similar

Streambed Slope Compared to Reach Comments:

Streambed Slope Comments:

### Other Details

Are there any Channel-Spanning hydraulic drops within the structure or the design channel greater than 0.50 feet? \_\_\_\_\_

No

If Yes, provide comments, including descriptions of any headcutting or aggrading:

Do other Design Features (LWM, coarse bands, barbs, preformed pools, etc) function as intended? \_\_\_\_\_

Yes

Features Comments:

Photos taken during inspection? Yes \_\_\_\_\_

### Final Determination

Is the structure Fish Passable? Yes \_\_\_\_\_

Risks noted to stream function, refer to category: \_\_\_\_\_

Actions determined by Monitoring: No Action Needed \_\_\_\_\_

Inspection Action Comments:

Additional Comments:

LWM removed from inlet per HPA modifications.



## Monitoring Report

### Site Details

Site ID: 990214 Road Name: SR 112 Mile Post: 33.21

Stream: Joe Cr Tributary to: Strait of Juan de Fuca

### Monitoring Inspection Details:

Inspection Type: Other

Inspection Date: 7/23/2018

Inspector(s): Damon Romero, Tammy Schmidt

### Monitoring Parameters (all intervals):

#### Streambed Material

Has the Site experienced a bankfull event? Yes

Is there streambed material throughout the Structure? Yes

Is there streambed material throughout the Design Channel? Yes

Freeboard at outlet (ft) at inlet (ft)

Compare the streambed material throughout the structure and design channel to the common condition:

Coarser

Streambed Material Comments:

Loss of bank materials on RB at inlet.

#### Channel Flow / Shape

Is there unusual subsurface flow compared to the common condition of the reach? Unknown

Does a low-flow channel exist through the entire length of the structure and design channel:

Yes

The depth of the channel throughout the structure and the design channel compared to the common condition of the reach is:

Similar

The channel shape throughout the structure and the design channel compared to the common condition of the reach is:

More Plane Form

Is the channel shape consistent with the design expectations?

No

If No or Undetermined, explain:

Describe the channel path within the structure and the design channel:

Straight Line

Does the channel contact the structure wall at any location?

Yes

If yes, the percentage of channel length in contact is:

Also, if yes, contact is:

Is there a measurable BFW inside the structure?

Bankfull Width (BFW) of the channel within the structure: (ft)

BFW inside the structure compared to the design channel:

Similar

BFW inside the structure compared to the common condition:

Similar



## Monitoring Report

BFW of the design channel compared to the common condition is: \_\_\_\_\_

There is a defined channel: Through the entire project. \_\_\_\_\_

Channel Additional comments:

Upwelling flow through substrate 5' inside culvert at inlet suggests some subsurface flow. BFW not measured.

### Streambed Slope

Streambed Slope (%) Upstream of the Structure: 2.32 Throughout the structure: 2.15

Downstream of the structure: 1.49 Overall project: \_\_\_\_\_

Describe streambed slope throughout the project compared to the common condition of the reach: \_\_\_\_\_

Similar

Streambed Slope Compared to Reach Comments:

Streambed Slope Comments:

### Other Details

Are there any Channel-Spanning hydraulic drops within the structure or the design channel greater than 0.50 feet? \_\_\_\_\_

No

If Yes, provide comments, including descriptions of any headcutting or aggrading:

Do other Design Features (LWM, coarse bands, barbs, preformed pools, etc) function as intended? \_\_\_\_\_

N/A

Features Comments:

Photos taken during inspection? Yes \_\_\_\_\_

### Final Determination

Is the structure Fish Passable? Yes \_\_\_\_\_

Risks noted to stream function, refer to category: \_\_\_\_\_

Actions determined by Monitoring: Increased Monitoring \_\_\_\_\_

Inspection Action Comments:

Additional Comments:

Changes to bed warrant continued monitoring.



## Monitoring Report

### Site Details

Site ID: 990214 Road Name: SR 112 Mile Post: 33.21

Stream: Joe Cr Tributary to: Strait of Juan de Fuca

### Monitoring Inspection Details:

Inspection Type: Other

Inspection Date: 6/25/2019

Inspector(s): Tammy Schmidt

### Monitoring Parameters (all intervals):

#### Streambed Material

Has the Site experienced a bankfull event? Yes

Is there streambed material throughout the Structure? Yes

Is there streambed material throughout the Design Channel? Yes

Freeboard at outlet (ft) at inlet (ft)

Compare the streambed material throughout the structure and design channel to the common condition:

Similar

Streambed Material Comments:

#### Channel Flow / Shape

Is there unusual subsurface flow compared to the common condition of the reach? Yes

Does a low-flow channel exist through the entire length of the structure and design channel:

No

The depth of the channel throughout the structure and the design channel compared to the common condition of the reach is:

Shallower

The channel shape throughout the structure and the design channel compared to the common condition of the reach is:

More Plane Form

Is the channel shape consistent with the design expectations?

No

If No or Undetermined, explain:

Mobilization of bank material at RB inlet is exacerbating localized low flow condition and loss of channel shape.

Describe the channel path within the structure and the design channel:

Straight Line

Does the channel contact the structure wall at any location?

Yes

If yes, the percentage of channel length in contact is:

25%

Also, if yes, contact is:

Single side

Is there a measurable BFW inside the structure?

No

Bankfull Width (BFW) of the channel within the structure: (ft)

BFW inside the structure compared to the design channel:

N/A

BFW inside the structure compared to the common condition:

N/A



## Monitoring Report

BFW of the design channel compared to the common condition is: N/A

There is a defined channel: Through a portion of the project.

Channel Additional comments:

Flow loss through seam between culvert sections. Temporarily fixed by creating a rock groin with sediment and filled crevice with fines.

### Streambed Slope

Streambed Slope (%) Upstream of the Structure:                      Throughout the structure:                     

Downstream of the structure:                      Overall project:                     

Describe streambed slope throughout the project compared to the common condition of the reach: N/A

Streambed Slope Compared to Reach Comments:

Streambed Slope Comments:

### Other Details

Are there any Channel-Spanning hydraulic drops within the structure or the design channel greater than 0.50 feet? No

If Yes, provide comments, including descriptions of any headcutting or aggrading:

Do other Design Features (LWM, coarse bands, barbs, preformed pools, etc) function as intended? N/A

Features Comments:

Photos taken during inspection? Yes

### Final Determination

Is the structure Fish Passable? No

Risks noted to stream function, refer to category:                     

Actions determined by Monitoring: Repair

Inspection Action Comments:

Replace material along RB inlet; reshape banks to restore a low-flow channel. Determine if flow is leaving through structure.

Additional Comments:



## Monitoring Report

### Site Details

Site ID: 990214 Road Name: SR 112 Mile Post: 33.21

Stream: Joe Cr Tributary to: Strait of Juan de Fuca

### Monitoring Inspection Details:

Inspection Type: Five Year

Inspection Date: 8/18/2021

Inspector(s): Tammy Schmidt

### Monitoring Parameters (all intervals):

#### Streambed Material

Has the Site experienced a bankfull event? Yes

Is there streambed material throughout the Structure? Yes

Is there streambed material throughout the Design Channel? Yes

Freeboard 6.10 at outlet (ft) 5.54 at inlet (ft)

Compare the streambed material throughout the structure and design channel to the common condition:

Similar

Streambed Material Comments:

Overall, subs are similar due to recruited material from upstream, however there remains a large deposit of cobbles in the lower 1/2 of the culvert that originated from the RB at inlet and is causing subsurface flow. RB scoured 0.6 m vertical from fill line (pink spray paint).

#### Channel Flow / Shape

Is there unusual subsurface flow compared to the common condition of the reach? Yes

Does a low-flow channel exist through the entire length of the structure and design channel:

No

The depth of the channel throughout the structure and the design channel compared to the common condition of the reach is:

Shallower

The channel shape throughout the structure and the design channel compared to the common condition of the reach is:

More Plane Form

Is the channel shape consistent with the design expectations?

No

If No or Undetermined, explain:

Subsurface flow through apprx 1/2 culvert length. Split thalweg rolled to the walls with deposition of bed material down the center - inverted channel.

Describe the channel path within the structure and the design channel:

Braided

Does the channel contact the structure wall at any location?

Yes

If yes, the percentage of channel length in contact is:

50%

Also, if yes, contact is:

Single side

Is there a measurable BFW inside the structure?

No

Bankfull Width (BFW) of the channel within the structure: (ft)

BFW inside the structure compared to the design channel:

N/A



## Monitoring Report

BFW inside the structure compared to the common condition:

N/A

BFW of the design channel compared to the common condition is:

Similar

There is a defined channel: Through a portion of the project.

Channel Additional comments:

US common condition consists of medium gravels and 4-12" cobbles with several large boulder erratic's. Log jam DS of culvert moved further DS and created a point bar with nice spawning gravels. Upwelling flow through substrate 5' inside culvert.

### Streambed Slope

Streambed Slope (%) Upstream of the Structure: -0.46 Throughout the structure: 1.22

Downstream of the structure: 2.42

Overall project:

Describe streambed slope throughout the project compared to the common condition of the reach:

Flatter

Streambed Slope Compared to Reach Comments:

Streambed Slope Comments:

Overall project slope = 1.52%. DS CC slope = 3-3.5%; inverted slope upstream of culvert is due to large pool under downed log.

### Other Details

Are there any Channel-Spanning hydraulic drops within the structure or the design channel greater than 0.50 feet?

No

If Yes, provide comments, including descriptions of any headcutting or aggrading:

Do other Design Features (LWM, coarse bands, barbs, preformed pools, etc) function as intended?

N/A

Features Comments:

Photos taken during inspection? Yes

### Final Determination

Is the structure Fish Passable? No

Risks noted to stream function, refer to category:

Actions determined by Monitoring: Modifications

Inspection Action Comments:

Subsurface flow persists through part of the structure which is not reflective of the common condition. General loss of channel shape and sub flow through the structure need corrected.

Additional Comments:

Unidentified salmonid juveniles observed US/DS of culvert.



## **Monitoring Report**

### **Attachments:**

2021\_0831\_WSDOT\_Retrofit\_TechMemo\_Joe.pdf

HydraulicProjectApproval\_JoeCr\_990214.pdf

Minor Modification Approval\_03-14-2017.pdf